VALIDATION AND AUDIT OF E-MEDIA DELIVERY

FIELD OF THE INVENTION

The present invention relates generally to printers, and more particularly to tracking the status and delivery of e-media.

BACKGROUND OF THE INVENTION

The advent of the Internet has opened electronic communication to people allover the world. Now, instead of using "snail-mail", i.e., placing letters and pictures in envelopes with the postal service and waiting for some period of time for the letters and pictures to be delivered, electronic data files, including digital pictures and the like, may be sent electronically to a desired recipient. However, the sender is generally unable to determine whether the recipient has received and consumed the electronic media that has been transferred to him/her, i.e., whether the e-media has been interacted with by the receiving party in a particular manner. On-line e-media audit and verification are not available.

Thus, there is a need for a method, computer-readable medium and system for providing e-media audit and verification in a digital content delivery service system.

SUMMARY OF THE INVENTION

In a digital content delivery service system, the present invention provides a method of sending and validating/auditing delivery of e-media. The method includes the steps of: obtaining or receiving e-media of a sender or user wherein the sender or user has indicated a requested type of delivery of the e-media to a client or receiving party; accessing an account of the sender or user to obtain sender or user information; sending the e-media to the client or receiving party; and receiving a validation or audit of the requested type of delivery upon receipt or consumption of the e-media by the client or receiving party. A client here is a software program that is installed on a PC

or other device. The client then interacts with the server side part of the solution to retrieve the eMedia and to, potentially, provide the validation level required. Where the validation or audit of the requested type of delivery is attended by the client or receiving party (attended means the end user is physically present and usually engaged in requesting the delivery of the eMedia), the validation or audit may include means to verify presence such as a biometric signature sent by the client/receiving party and/or a user's encrypted/unencrypted Unique IDentifier entered by the client/consumer/receiving party to indicate that the e-media has been received/consumed. Alternatively, the validation/audit of the requested type of delivery may be unattended by the client/receiving party. The e-media may be received/consumed by printing, by viewing, or the like. Validation/audit of delivery may be separated in time from a time when the content was delivered to the device. The system may wait until the next time the end user interacts with it before it sends the validation.

The present invention provides a computer-readable medium having computer-executable instructions for sending and validating/auditing delivery of e-media by a digital content delivery service system. The computer-executable instructions typically include the steps of: obtaining/receiving e-media of a sender/user wherein the sender/user has indicated a requested type of delivery of the e-media to a client/receiving party; accessing an account of the sender/user to obtain sender/user information; sending the e-media to the client/receiving party; and receiving a validation/audit of the requested type of delivery upon receipt/consumption of the e-media by the client/receiving party. Where the validation/audit of the requested type of delivery is attended by the client/receiving party, the validation/audit may include, for example,
a biometric signature sent by the client/receiving party and/or a user's encrypted/unencrypted Unique IDentifier entered by the client/consumer/receiving party to indicate that the e-media has been received/consumed. Where selected, the validation/audit of the requested type of delivery may be unattended by the client/receiving party. The e-media may be received/consumed by printing, viewing, or the like.

The present invention also provides a digital content delivery service system for sending and validating/auditing delivery of e-media. The system typically includes an interface e-media transfer unit, a validation/audit processing unit, and a sender/user account storage unit. The interface e-media transfer unit is arranged to communicate with a plurality of senders/users and is coupled to a sender/user account storage unit. The interface e-media transfer unit is programmed to obtain/receive e-media of a sender/user wherein the sender/user has indicated a requested type of delivery of the e-media to a client/receiving party and to store sender/user information and requested type of delivery in the sender/user account storage unit. The validation/audit-processing unit is coupled to the interface e-media transfer unit and to the sender/user account storage unit. The validation/audit processing unit obtains sender/user information and the requested type of delivery from the sender/user account storage unit, sends the e-media to the client/receiving party, may audit requests to send/receive the e-media, and obtains validation/audit information for receipt/consumption of the e-media. The sender/user account storage unit is coupled to the interface e-media transfer unit and to the validation/audit processing unit. The sender/user account storage unit is utilized for storing sender/user information and a requested type of delivery of e-media. Where at least part of the validation/audit information of the requested type of delivery may be provided by the client/receiving party, the validation/audit information may include a biometric signature sent by the client/receiving party and/or a user's encrypted/unencrypted Unique IDentifier entered by the client/consumer/receiving party to indicate receipt/consumption of the e-media. Where selected, the validation/audit information of the requested type of delivery may be automatically provided by a device or devices of the client/receiving party such as, for example, a printing device or a viewing device or software acting as a proxy or device driver for them. The receipt or consumption of the e-media may be achieved by printing, viewing, or the like.

In another embodiment, the present invention may be implemented by a method, in a digital content delivery system, for performing an attended validation/audit of delivery of e-media, that includes the steps of: packaging, by the sender/user, the e-media and specifying a level of feedback; requesting, by the sender/user, a delivery service to deliver the e-media; accessing, by the delivery

service, the sender/user account to obtain pertinent information; transmitting, by the delivery service, the e-media to the client/receiving party; delivering of the e-media to a personal computer/device of the client/receiving party; and validating, by the client/receiving party, that the e-media has been received. The step of delivering the e-media to a personal computer/device of the client/receiving party may include informing the delivery service that the e-media was delivered and/or determining a desired level of delivery validation.

The step of delivering the e-media to a personal computer/device of the client/receiving party may include informing the delivery service that the e-media was delivered and/or verifying utilization by the receiving party. The step of validating, by the client/receiving party, that the e-media has been received may include sending, by the client/receiving party, a biometric signature and/or entering a user's encrypted/unencrypted Unique IDentifier by the client/consumer/receiving party to indicate that the e-media has been utilized.

In another embodiment, the present invention may be implemented by a method, in a digital content delivery system, for performing an unattended validation/audit of delivery of printed e-media, where the steps include: packaging, by the sender, the e-media and specifying the level of feedback; receiving, by the delivery service, the e-media delivery request; accessing, by the delivery service, the sender/user account to obtain pertinent information; transmitting, by the delivery service, the e-media to the client/receiving party; delivering of the e-media to a printer of the client/receiving party; and validating, by a printer of the client/receiving party, that the e-media has been received/consumed. The step of transmitting, by the delivery service, the e-media to the client/receiving party may include informing the delivery service that the e-media was transmitted and/or determining a desired level of delivery validation/audit. The step of delivering the e-media to a personal printer of the client/receiving party may include informing the delivery service that the e-media was delivered and/or verifying receipt/consumption by the client/receiving party. The step of validating, by the printer of the client/receiving party, that the e-media has been received/consumed may include automatically sending, by the printer of the client/receiving party, a biometric signature and/or automatically entering a user's encrypted/unencrypted Unique IDentifier by the printer of the

client/consumer/receiving party to indicate that the e-media has been received/consumed.

In another embodiment, the present invention may be implemented as a method, in a digital content delivery system, for performing an unattended validation/audit of delivery of e-media, where the steps include: packaging, by the sender/user, the e-media and specifying, by one of: the sender/user and a client/receiving party, the level of feedback; requesting, by the sender/user, the delivery service to deliver the e-media; accessing, by the delivery service, the sender/user account to obtain pertinent information; transmitting, by the delivery service, the e-media to the client/receiving party; delivering of the e-media to a consumption device of the client/receiving party; and validating, by the consumption device of the client/receiving party, correct delivery of the e-media. The pertinent information may include at least one of: a user's encrypted/unencrypted Unique IDentifier; identification of the e-media; and a desired level of delivery validation/audit feedback. The step of validating, by the consumption device of the client/receiving party, the correct delivery of the e-media may include validating a user's encrypted/unencrypted Unique Identifier.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a flow chart showing one embodiment of steps of a method of sending and validating/auditing delivery of e-media in accordance with the present invention.

Figure 2 is a block diagram of one embodiment of a computer-readable medium having computer-executable instructions for sending and validating/auditing delivery of e-media by a digital content delivery service system in accordance with the present invention.

Figure 3 is a block diagram of one embodiment of a digital content delivery service system for sending and validating/auditing delivery of e-media in accordance with the present invention.

Figure 4 shows a flow diagram of one embodiment of a method for providing attended validation of e-media in a digital content delivery system in accordance with the present invention.

Figure 5 shows a flow diagram of one embodiment of a method for providing unattended validation of printed e-media in a digital content delivery system in accordance with the present invention.

Figure 6 shows a flow diagram for one embodiment of a method for performing an unattended validation/audit of delivery of e-media in a digital content delivery system in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention provides a method, a computer-readable medium and a digital content delivery system for validating or auditing delivery of electronic media, i.e., e-media. The sender or user may specify a requested type of delivery for the e-media. Then, the digital content delivery system either obtains the e-media from the sender/user or receives the e-media from the sender/user. After checking the sender/user's account for pertinent information, the digital content delivery system sends the e-media to the client or receiving party, tracks the client's or receiving party's receipt/consumption of the e-media, and provides a validation or audit of the receipt/consumption. Such a system provides specific information to the sender/user with respect to the client's/receiving party's interaction with the e-media, providing a valuable service, for example, for publishers who want to know what articles or advertisements the client/receiving party reviewed. Typically, the specific information may include, for example, the time that the client/receiving party interacted with the e-media, which portions of the e-media were reviewed by the client/receiving party, whether the e-media was printed, whether the printing operation was successful, how many copies were printed, and the like. Where desired, the e-media may be unforwardable, e.g., packaged to be transmittable only to a particular computer, in order to limit the distribution to clients/receiving parties who have arranged to pay to receive the information. Packaging is the process wherein the server side software combines the eMedia being delivered along with other instructions, encodings, etc. and incorporates them into a single logical object—similar to the way an email message with attachments comes across as a single object. This allows the server side system as well as any client software to deal with the entire object as a single entity.

The sender/publisher may specify whether it is necessary for a specific individual, a designated individual, or any individual to be present to receive the electronic material being sent. A query of the e-media's location and status is available to the sender/publisher at any time. The sender typically also specifies the level of feedback desired for the specific e-media being sent. Some choices may include determining if the document/material was printed, how long did it take for the electronic material to reach the client's system, or did the end user interact with the content of the e-media for a period of time before responding that it was received. For example, with respect to email, a sender may decide on its own to originate content and send it to the receiving party, requesting validation and/or audit. Also, with respect to the Internet, a receiving party may request validation and/or audit when it requests content from a sender.

Clearly, validation and audit are different. Validation indicates that delivery was obtained. For example, validation may be implemented by using sensors that indicate ink hitting paper, paper landing in the output tray, and the like. Audit indicates a record of the chain of delivery events along the way, e.g., a request to obtain content, content arrived, printing of content initiated, printing of content completed, and the like. Receiving parties as well as senders may request validation and/or audit since receiving parties may desire an audit trail for their own purposes, such as remuneration, studies, and the like.

Where the receiving party attends validation of e-media delivery, the sender/publisher may specify numerous options about which individual may receive the e-media. This may include requiring that a unique encrypted identification code be entered in order to receive the e-media, that a biometric signature be entered to obtain the e-media, or that material of a less sensitive nature may be claimed by any individual with an account on the designated device. A complex or simple response of receipt may also be required. As with the unattended version, levels of feedback about the e-media's tractability may also be established by the sender/publisher. The tracing information may be "packaged" with the e-media and sent to the digital content delivery service. The delivery service gathers the pertinent components to fulfill the sender's request. Where desired, the e-media may be sent by the sender/user to the digital content delivery service. Alternatively, as is known in the

art, the digital content delivery service may be arranged to "pull" the e-media from the sender/user. The e-media may then be transmitted to the client/receiving party. If there has been an authentication of recipient request from the sender, a biometric signature from the recipient may be necessary to receive the e-media. Whatever criterion was established by the sender for the recipient must be observed in order to obtain the e-media. There are many ways that may be used to specify what is to be tracked. In one embodiment, a device may select always reporting an event and a server may decide whether to record the event or not.

Once the e-media has been received by the intended addressee, a confirmation of acceptance is initiated by the recipient. The confirmation may be performed in numerous ways. Some examples include, but are not limited to, scanning of an embedded code on the e-media, entering a unique key code found on the e-media, or playing, showing or executing the e-media itself. This confirmation information is received by the client from the user/appliance interface and transmitted back to the digital content delivery service. The delivery service then notifies the sender that their transaction is complete.

In a digital content delivery service system, the present invention provides a method of sending and validating/auditing delivery of e-media. As shown in Figure 1, the method 100 includes the steps of: obtaining/receiving 102 e-media of a sender/user wherein the sender/user has indicated a requested type of delivery of the e-media to a client/receiving party; accessing 104 an account of the sender/user to obtain sender/user information; sending 106 the e-media to the client/receiving party; and receiving 108 a validation/audit of the requested type of delivery upon receipt/consumption of the e-media by the client/receiving party. Clearly, the e-media may be "pulled" from the sender/user, or alternatively, may be sent to the delivery system by the sender/user. E-media may be transmitted using wireless devices, or alternatively, may be sent using land lines such as, for example, telephone lines, cable connections and the like.

Where validation/audit of the requested type of delivery is attended by the client/receiving party, i.e., the client/receiving party provides at least part of information for the validation/audit, the validation/audit may include a biometric signature sent by the client/receiving party and/or a user's encrypted/unencrypted

Unique IDentifier entered by the client/consumer/receiving party to indicate that the e-media has been received/consumed. In another embodiment, the validation/audit of the requested type of delivery may be unattended by the client/receiving party. The e-media is received/consumed by printing or may be received/consumed other than by printing, e.g., by viewing.

Figure 2 is a block diagram of one embodiment of a computer-readable medium 200 having computer-executable instructions for sending and validating/auditing delivery of e-media by a digital content delivery service system in accordance with the present invention. In one embodiment, the computer-executable instructions include the steps of: obtaining/receiving 202 e-media of a sender/user wherein the sender/user has indicated a requested type of delivery of the e-media to a client/receiving party; accessing 204 an account of the sender/user to obtain sender/user information; sending 206 the e-media to the client/receiving party; and receiving 208 a validation/audit of the requested type of delivery upon receipt/consumption of the e-media by the client/receiving party. Where the validation/audit of the requested type of delivery is attended by the client/receiving party, the validation/audit may include a biometric signature sent by the client/receiving party and/or a user's encrypted ID Unique IDentifier entered by the client/consumer/receiving party to indicate that the e-media has been received/consumed. Alternatively, the validation/audit of the requested type of delivery may be unattended by the client/receiving party, and validation/audit is carried out automatically by the digital content delivery service system. The e-media may received/consumed by printing, viewing, audio presentation or the like.

Figure 3 is a block diagram of one embodiment of a digital content delivery service system 300 for sending and validating/auditing delivery of e-media in accordance with the present invention. The digital content delivery service system 300 includes an interface e-media transfer unit 302, a validation/audit processing unit 304, and a sender/user account storage unit 306. The interface e-media transfer unit 302 is arranged to communicate with at least one of: a plurality of senders/users and other digital content delivery service system/systems and is coupled to a sender/user account storage unit 306 and a validation/audit processing unit 304. The interface e-media transfer unit 302 is programmed to obtain/receive e-media of a sender/user

wherein the sender/user has indicated a requested type of delivery of the e-media to a client/receiving party and to store sender/user information and requested type of delivery in the sender/user account storage unit. The validation/audit processing unit 306 is coupled to the interface e-media transfer unit 302 and to the sender/user account storage unit 304. The validation/audit processing unit 306 obtains sender/user information and the requested type of delivery from the sender/user account storage unit 304, sends or transmits the e-media to the client/receiving party, and obtains validation/audit information for receipt/consumption of the e-media. Consumption means interaction of the client/receiving party with the e-media. The sender/user account storage unit 304 is coupled to the interface e-media transfer unit 302 and to the validation/audit processing unit 306. The sender/user account storage unit 304 stores sender/user information and the requested type of delivery of e-media by the sender/user.

If at least part of the validation/audit information of the requested type of delivery is provided by the client/receiving party, the validation/audit information may include, for example, a biometric signature sent by the client/receiving party and/or a user's encrypted Unique IDentifier entered by the client/consumer/receiving party to indicate receipt/consumption of the e-media. Alternatively, the validation/audit information of the requested type of delivery may be automatically provided by a device/devices of the client/receiving party. For example, a printer of the client/receiving party may receive the e-media, print out the e-media, determine that the entire e-media was printed and send the validation information to the delivery system. The receipt/consumption of the e-media may be achieved by printing, viewing electronically, outputting audio or the like.

The digital content delivery system unit represented by 300 may be chained together such that there maybe many storage points, many interfaces/transfer units, and many validation/audit units participating between the sender and the receiving party.

An example of one embodiment of a method 400 for providing attended validation of e-media in accordance with the present invention is illustrated in Figure 4: (1) packaging 402, by the sender, the e-media and specifying the level of feedback; (2) requesting 404, by the sender/user, the delivery service to deliver the e-media; (3)

accessing 406, by the delivery service, the sender/user account to obtain pertinent information; (4) transmitting 408, by the delivery service, the e-media to the client/receiving party; (5) delivering 410 of the e-media to a personal computer/device of the client/receiving party; and (6) validating 412, by the client/receiving party, that the e-media has been received.

The step of packaging 402 typically indicates that the level of feedback may be one of: receiving an indication that e-media is printed, receiving a response to an audit path query with respect to progress, or receiving a report when the e-media is utilized. The step of accessing 406 the sender/user account for pertinent information may include validating an encrypted user key and a Unique IDentifier (UID), identifying the e-media to be sent, providing designated feedback, and/or informing the sender/user upon e-media utilization.

A UID is often a unique number used to identify an object. In one embodiment, the UID is computed by adding the time and date to the network adapter's internal serial number. Standard applications, such as word processors and spreadsheets, may be written to expose their internal functions as objects, allowing them to be "automated" instead of manually selected from a menu. For example, a script may be written to extract data from a database, summarize and chart it in a spreadsheet and place the results into a text document. In addition, applications may invoke objects called controls that blend in and become just another part of the program. Third-party, ready-made controls have been created that may be downloaded from the Internet, for example, to make a Web page perform desired processing. Often, the UID is not entered by a user directly since it would usually be impractical to do so. However, many UIDs can be provided by or entered by a user, such as an email address.

The step of delivering 410 of the e-media to a personal computer/device of the client/receiving party may include informing the delivery service that the e-media was delivered, determining a desired level of delivery validation, and/or verifying utilization by the receiving party. The step of validating 412, by the client/receiving party, that the e-media has been received may include sending, by the client/receiving party, a biometric signature or entering a user's encrypted UID by the

client/consumer/receiving party to indicate that the e-media has been utilized/consumed.

Where the e-media is published by being transmitted to a device for printing without intervention/direct receipt by the receiving party, and validation is desired by the sender, the sender specifies the desired feedback, which may be "packaged" and sent to the Digital content delivery service along with the actual documents. The delivery service receives the package, ascertains which feedback mechanisms are requested and implements the tracking/audit process necessary to achieve this feedback. The documents are then transmitted to the digital content delivery service system client's PC or other device. The client's device then verifies that the document was printed correctly, with either an attached scanning appliance, using a checksum verification, or some other mechanism. If the delivery confirmation was requested, a feedback message is transmitted from the printer or device, along with other information that was specified to the digital content delivery service system client's PC or other device. The desired feedback is then sent to the e-Media publishing services. Here the feedback may be available for the sender to retrieve upon a query, or the sender may have specified that he/she wants to the informed when the documents are delivered and printed. In the later case, the delivery service transmits the delivery information to the original sender/publisher.

An example of one embodiment of a method 500 for providing unattended validation of printed e-media in accordance with the present invention is illustrated in Figure 5. The method includes the steps of: packaging 502, by the sender, the e-media and specifying the level of feedback; receiving 504, by the delivery service, the e-media delivery request; accessing 506, by the delivery service, the sender/user account to obtain pertinent information; sending/transmitting 508, by the delivery service, the e-media to the client/receiving party; delivering 510 of the e-media to a printer of the client/receiving party; and validating 512, by the printer of the client/receiving party, that the e-media has been received/consumed. The step of sending/transmitting 508, by the delivery service, the e-media to the client/receiving party may include informing the delivery service that the e-media was transmitted and/or determining a desired level of delivery validation/audit. The step of delivering 510 the e-media to the printer of the client/receiving party may include informing the

delivery service that the e-media was delivered and/or verifying receipt/consumption by the client/receiving party.

The step of validating 512, by the printer of the client/receiving party, that the e-media has been received/consumed may include, for example, one of: automatically sending, by the printer of the client/receiving party, a biometric signature; and automatically entering a user's encrypted Unique IDentifier by the printer of the client/consumer/receiving party to indicate that the e-media has been received/consumed.

When the e-media is received, but the receiving party is not in attendance, the sender may specify the desired feedback. The e-media is then "packaged and sent to the digital content delivery service. The delivery service determines what audit process and delivery validation have been established by the sender and transmits the e-media to the recipient. Using techniques such as checksums, a private key encryption or the like, verification of delivery may be confirmed. The checksum values are validated, and the appliance receiving the e-media then sends back a unique token, such as an encrypted key, to the digital content delivery service confirming that the delivery was complete. Depending on the feedback requested by the sender/publisher, the digital content delivery service then reports back to the sender.

Figure 6 shows one embodiment of a method 600 for performing an unattended validation/audit of delivery of e-media in a digital content delivery system in accordance with the present invention. The method includes: packaging 602, by the sender/user, the e-media and specifying by one of: the sender/user and a client/receiving party, the level of feedback; requesting 604, by the sender/user, the delivery service to deliver the e-media; accessing 606, by the delivery service, the sender/user account to obtain pertinent information; transmitting 608, by the delivery service, the e-media to the client/receiving party; delivering 610 of the e-media to a consumption device of the client/receiving party; and validating 612, by the consumption device of the client/receiving party, correct delivery of the e-media. The pertinent information may include, for example, a user's encrypted Unique Identifier, identification of the e-media, and/or a desired level of delivery validation/audit feedback. The step of validating 612, by the consumption device of the client/receiving party, the correct delivery of the e-media may include validating a

user's encrypted Unique Identifier. The consumption device may be a viewing device such as a television monitor, a personal computer viewing screen, may be a printing device, an audio device or the like.

Other types of validation may, for example, be:

- sender wants to know that the material was viewed/printed;
- sender wants acknowledgement from user of receipt;
- sender wants to know when user received and then interacted with the eMedia;
- sender wants regular updates on status of material (e.g., the HP e-Media publishing service has the content and is waiting for the intended recipient's device to connect with the service so that it can be delivered;
- receiving party wants an audit trail of the deliveries made to a system;
- receiving party wants validation of delivery to a device, e.g., a printer, to be tallied to that device's consumables use or to use of the device by a particular user's account.

Although the present invention has been described in relation to particular preferred embodiments thereof, many variations, equivalents, modifications and other uses will become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure herein, but only by the appended claims.